

Applicant : Peters et al.
Appl. No. : 10/595,603
Examiner : Gary Porter, Jr.
Docket No. : 13634.4010

IN THE CLAIMS:

1. (Currently Amended) A percutaneous gas-line for an implantable medical device, the gas-line including:

a first gas-line part ~~adapted to be~~ wholly implantable in a patient and having a first end with a connection fitting ~~adapted~~ for sealing connection to the medical device and a second end with a connection fitting; ~~and~~

a second gas-line part ~~adapted to be~~ part-implantable in the patient and part-external to the patient and having a first (external) end external to the patient ~~adapted~~ for sealing connection to an external driver and a second (implanted) end implanted in the patient ~~adapted~~ for removable sealing connection with the connection fitting on the second end of the first gas-line part, wherein the connection between the first gas-line part and the second gas-line part is ~~adapted to be~~ positionable ~~fully~~ within the body of the patient in spaced relation with an exit site in the body of the patient through which the second gas-line part ~~is adapted to passes, and~~ a subcutaneous anchoring collar positioned about the second gas-line part positionable fully with the body of the patient in spaced relationship with the exit site in the body and in spaced relationship with the connection between the first gas-line part and the second gas-line part.

2. (Currently Amended) The gas-line as claimed in claim 1, wherein the second gas-line part is ~~further adapted to be removable from within the patient~~, for replacement, in the presence of persistent exit-site infection.

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3. (Currently Amended) The gas-line as claimed in claim ~~1~~ 2, wherein the first ~~external~~ end of the second gas line is removably connected to the external driver.

4. (Previously Presented) The gas-line as claimed in claim 1, wherein an ECG lead adapted to connect a patient's heart with a control system for a heart assist device is incorporated into the first gas line part and/or the second gas line part.

5. (Previously Presented) The gas-line as claimed in claim 1, wherein the second gas-line part is constructed to have a minimal outside diameter, high flexibility and a resistance to kinking.

6. (Original) The gas-line as claimed in claim 5, wherein the second gas-line part has an outside diameter less than 7 mm.

7. (Previously Presented) The gas-line as claimed in claim 1, wherein the second gas-line part is made of a soft biocompatible, biostable material.

8. (Original) The gas-line as claimed in claim 7, wherein the second gas-line part is made from silicone 45-65A durometer.

9. (Currently Amended) The gas-line as claimed in claim 1, wherein the connection fitting is a Luer-lock ~~or similar~~ gas-tight fitting.

10. (Currently Amended) The gas-line as claimed in claim 1, wherein the ~~first and/or second gas line parts have collar is a fluffy polyester, or similar, collar over about a short section of their the implanted length the second gas-line part.~~

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11. (Withdrawn) A method of providing heart assistance to a patient using a percutaneous gas- line having a first gas-line part, adapted to be wholly implanted, and a second gas-line part, adapted to be part implanted and part external, connected to the first gas-line part, the method including the steps of : (1) recognising a persistent exit-site infection; (2) disconnecting the second gas-line part from the first gas-line part; (3) removing the second gas-line part from the patient; and (4) connecting a sterile second gas-line part to the first gas-line part wherein the fresh second gas-line part is inserted through a fresh exit-site that is remote to the infected exit-site.

12. (Withdrawn) The method as claimed in claim 11, wherein the fresh second gas-line part is inserted through an implant tunnel that is also substantially remote from the existing implant tunnel.

13. (Withdrawn) The method as claimed in claim 11, wherein after step (3), the first gas-line part is sealed and wounds are closed to allow healing to occur.

14. (Withdrawn) A gas line for connecting an inflatable heart assist actuator to a driver therefore, the gas line having a first end operatively connected to the inflatable actuator and a second end connectable, directly or indirectly through an extension gas line, to the driver for the heart assist actuator, the gas line having attached to it an ECG lead, the ECG lead having a first end adapted for connection to the heart of a patient and a second end adapted for connection to the driver or a controller for the driver, the attachment between the gas lead and the ECG lead being such that they are adapted to pass through the skin of a patient as a single element.

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15. (New) In an implantable medical device implanted within a body of a patient, the medical device including a percutaneous gas-line connecting the medical device to a gas driver located external to the body of the patient, the improvement comprising:

a first gas-line part wholly implantable in the body of the patient and having a first end with a connection fitting sealingly couplable to the medical device and a second end with a connection fitting; and

a second gas-line part implantable in part within the body of the patient and positionable in part external to the body of the patient and having a first end external to the body of the patient couplable to the external gas driver and a second end implantable within the body of the patient removably couplable with the connection fitting on the second end of the first gas-line part, wherein the connection between the first gas-line part and the second gas-line part is positionable fully within the body of the patient in spaced relation with an exit site in the body of the patient through which the second gas-line part passes.

16. (New) In the medical device of claim 15, further comprising a subcutaneous anchoring collar positioned about the second gas-line positionable fully with the body of the patient in spaced relationship with the exit site in the body and in spaced relationship with the connection between the first gas-line part and the second gas-line part.

17. (New) In the medical device of claim 15, wherein the second gas-line part is removable from within the patient, for replacement, in the presence of persistent exit-site infection.

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18. (New) In the medical device of claim 15, wherein an ECG lead adapted to connect a patient's heart with a control system for a heart assist device is incorporated into the first gas line part and/or the second gas line part.

19. (New) In the medical device of claim 15, wherein the second gas-line part is constructed to have a minimal outside diameter, high flexibility and a resistance to kinking.

20. (New) In the medical device of claim 15, wherein the second gas-line part is made of a soft biocompatible, biostable material.

21. (New) In the medical device of claim 15, wherein the second gas-line part is made from silicone 45-65A durometer.

22. (New) In the medical device of claim 15, wherein the connection fitting is a Luer-lock gas-tight fitting.

23. (New) In the medical device of claim 16, wherein the collar is formed from a fluffy polyester.